

Supplementary Table 3.

Results of instrumental variable analyses for recurrence-free survival and overall survival, in which the instrumental variable was defined as the proportion of TIVA at each of 47 prefectures

	Recurrence-free survival			Overall survival		
	Hazard ratio	95% confidence interval	P-value	Hazard ratio	95% confidence interval	P-value
Type of anesthesia						
Volatile anesthesia	ref			ref		
Total intravenous anesthesia	0.91	0.76–0.94	0.038	1.31	0.85–1.98	0.212
Age (years)						
≤59	ref			ref		
60–69	1.20	1.15–1.25	<0.001	1.12	0.89–1.41	0.320
70–79	1.48	1.42–1.53	<0.001	1.61	1.30–1.99	<0.001
≥80	2.11	2.01–2.21	<0.001	1.39	1.11–1.75	0.005
Sex, male	1.30	1.26–1.34	<0.001	1.50	1.31–1.71	<0.001
Body mass index, kg/m ²						
<18.5	1.28	1.24–1.33	<0.001	1.17	1.01–1.35	0.041
18.5–24.9	ref			ref		
25.0–29.9	0.93	0.90–0.96	<0.001	1.01	0.88–1.17	0.862
30.0–34.9	1.00	0.91–1.09	0.929	1.18	0.83–1.69	0.356
≥35.0	0.94	0.76–1.17	0.572	1.66	0.78–3.51	0.187
Charlson comorbidity index						
2	ref			ref		
3	1.24	1.17–1.30	<0.001	1.38	1.14–1.68	0.001
≥4	1.54	1.49–1.58	<0.001	1.73	1.54–1.95	<0.001
Cancer stage						
0 or I	ref		<0.001	ref		
II	1.56	1.50–1.63	<0.001	1.60	1.35–1.90	<0.001
III	2.02	1.94–2.10	<0.001	2.40	2.02–2.84	<0.001

IV	4.35	4.15–4.55	<0.001	6.91	5.82–8.22	<0.001
Preoperative adjuvant therapy	1.60	1.52–1.67	<0.001	0.57	0.45–0.73	<0.001
Postoperative adjuvant therapy	3.02	2.93–3.12	<0.001	0.08	0.06–0.09	<0.001
Preoperative renal replacement therapy	2.04	1.80–2.31	<0.001	2.24	1.69–2.96	<0.001
Smoking	1.10	1.07–1.13	<0.001	1.16	1.03–1.30	0.011
Preoperative or intraoperative blood transfusion	1.67	1.63–1.72	<0.001	2.65	2.36–2.98	<0.001
Preoperative morphine or oxycodone	1.40	1.24–1.59	<0.001	3.59	2.56–5.04	<0.001
Academic hospital	1.11	1.07–1.14	<0.001	1.25	1.08–1.45	0.004
Year of surgery						
2010 (Jul–Dec)	ref			ref		
2011 (Jan–Dec)	0.99	0.95–1.04	0.807	1.00	0.83–1.20	0.986
2012 (Jan–Dec)	0.99	0.94–1.03	0.584	0.85	0.69–1.04	0.123
2013 (Jan–Dec)	0.95	0.91–1.00	0.057	0.64	0.51–0.80	<0.001
2014 (Jan–Dec)	0.88	0.83–0.92	<0.001	0.66	0.53–0.82	<0.001
2015 (Jan–Dec)	0.88	0.83–0.92	<0.001	0.59	0.47–0.74	<0.001
2016 (Jan–Dec)	0.81	0.76–0.85	<0.001	0.52	0.41–0.65	<0.001
2017 (Jan–Dec)	0.89	0.83–0.95	0.001	0.48	0.38–0.60	<0.001
2018 (Jan–Mar)	0.86	0.60–1.23	0.413	0.58	0.35–0.97	0.039
Barthel index						
100	ref			ref		
0–95	1.35	1.29–1.41	<0.001	1.54	1.34–1.76	<0.001
Hospital volume						
Low (<125)	ref			ref		
Medium (125–245)	0.96	0.93–0.99	0.012	0.76	0.66–0.86	<0.001
High (>245)	0.88	0.85–0.91	<0.001	0.63	0.54–0.74	<0.001
At least one postoperative complication	1.43	1.37–1.49	<0.001	7.65	6.86–8.53	<0.001